TIMOTHY N. JONES et al.
Application No.: 09/264,547
Page 2

PATENT

(a)   scanning the patient's dentition, or a physical model thereof, to produce a data set that forms a three-dimensional (3D) representation of the patient's dentition having a plurality of components therein;

(b)   applying a computer-implemented test to the data set to identify data elements that represent boundary portions of an individual component of the patient's dentition to facilitate separating the dentition into individual components;

(c)   creating a digital model of the individual component based upon the identified data elements; and

(d)   producing a plurality of digital data sets representing a series of successive tooth arrangements progressing from an initial tooth arrangement to a successive tooth arrangement.

9.   (Twice Amended) A computer-implemented method for use in creating a digital model of an individual component of a patient's dentition, the method comprising:

(a)   scanning the patient's dentition, or a physical model thereof, to produce a data set that forms a three-dimensional (3D) representation of the patient's dentition;

(b)   applying a computer-implemented test to the data set to identify data elements that represent portions of an individual component of the patient's dentition;

(c)   creating a digital model of the individual component based upon the identified data elements, wherein the individual component is an individual tooth in the patient's dentition; and

(d)   producing a plurality of digital data sets representing a series of successive tooth arrangements progressing from an initial tooth arrangement to a successive tooth arrangement.

21.   (Amended) The method of claim 20, wherein applying the computer-implemented test includes applying a test to link other data elements to those representing the structural core and labeling the linked data elements as belonging to the individual component.

98.   (Twice Amended) A computer-implemented method for use in creating a digital model of a tooth in a patient's dentition, the method comprising:

(a)   scanning the patient's dentition, or a physical model thereof, to produce a 3D dataset representing at least a portion of the patient's dentition, including at least a portion of a tooth and gum tissue surrounding the tooth;

(b)   applying a test to identify data elements lying on a gingival boundary that occurs where the tooth and the gum tissue meet;

(c)   applying a test to the data elements lying on the boundary to identify other data elements representing portions of the tooth; and

(d)   producing a plurality of digital data sets representing a series of successive tooth arrangements progressing from an initial tooth arrangement to a successive tooth arrangement.

100.   (Amended) A computer-implemented method for use in creating a digital model of a tooth in a patient's dentition, the method comprising:

(a)   scanning the patient's dentition, or a physical model thereof, to produce a 3D dataset representing at least a portion of the patient's dentition, including at least a portion of a tooth and gum tissue surrounding the tooth;

(b)   applying a test to identify data elements lying on a gingival boundary that occurs where the tooth and the gum tissue meet;

(c)   applying a test to the data elements lying on the boundary to identify other data elements representing portions of the tooth, wherein applying the test to identify data elements on the gingival boundary includes creating an initial 2D plane that intersects the dentition roughly perpendicular to an occlusal plane of the dentition and that includes data elements representing an initial cross-sectional surface of the dentition and wherein applying the test includes locating a cusp in the initial cross-sectional surface.

107.   (Amended) The method of claim 100, wherein applying the test includes locating two cusps in the initial cross-sectional surface.